

5 Apr 1994

TS1AA-A

TEST SET, ELECTRICAL

1. GENERAL. This procurement requires a hand-held, true rms, digital multimeter with frequency counting capability, two temperature probes, and a current probe.

2. CLASSIFICATION. Type II, Class 3, Style EP, and Color R in accordance with MIL-T-28800 for shipboard applications. The transit drop test is invoked in accordance with MIL-T-28800.

3. PERFORMANCE REQUIREMENTS. The equipment shall be capable of measuring voltage, resistance, frequency, current, and temperature within the minimum specifications detailed below. The equipment shall respond to and display the true rms value of ac signals.

3.1 Voltage measurement. Range: 500 mV to 1,000V full scale. Maximum resolution: 0.1 mV. Accuracy: dc: $\pm(0.1\%$ of reading + 1 digit), ac: $\pm(1\%$ of reading + 4 digits) from 50 Hz to 5 kHz and 0 to 1,000 Vrms, $\pm(2\%$ of reading + 4 digits) from 5 kHz to 20 kHz and 0 to 400 Vrms.

3.1.1 Crest factor. 3.0 minimum.

3.1.2 Noise rejection. DC: normal mode: >60 dB at 50 or 60 Hz, common mode: >120 dB at dc, 50 or 60 Hz. AC: common mode >60 dB at dc to 60 Hz.

3.2 Current measurement. Range: 500 uA to 10A full scale, ac and dc. AC frequency range: 50 Hz to 500 Hz. Maximum resolution: 0.1 uA. Accuracy: dc: $\pm(0.2\%$ of reading + 2 digits), ac: $\pm(1.0\%$ of reading + 2 digits). Overload protection: 1A on uA and mA ranges, 15A on amp ranges.

3.3 Resistance measurement. Range: 0 to 20 megohms full scale. Maximum resolution: 0.1 ohm. Accuracy: $\pm(1.0\%$ of reading + 5 digits). Overload protection: 500 Vrms.

3.4 Frequency measurement. Range: 50 Hz to 500 Hz. Minimum pulse width: 10 us. Maximum resolution: 0.01 Hz. Accuracy: $\pm(0.005\%$ of reading + 1 digit).

3.5 Display. A 3-1/2 digit backlit liquid crystal display with an analog bar graph for peaking and nulling shall be provided. The display shall have indicators for input overload and polarity.

3.6 Memory. The equipment shall be capable of capturing and holding a reading for display and of storing and displaying the minimum, maximum, and average of all readings taken over an indefinite period of time. The equipment shall give an audible indication when a new minimum or maximum value has been recorded. In addition, the equipment shall be capable of displaying the difference between a reading stored in memory and any subsequent readings.

3.7 Input impedance. 10 megohms, nominal, shunted by 100 pf or less.

3.8 Input connectors. Input connectors shall be banana jacks spaced 19 mm (0.75 in) apart for use with dual-banana connectors.

3.9 Probes. The equipment shall be provided with safety-designed test leads in accordance with MIL-T-28800. The test set shall have probes for measuring temperature and current that meet the requirements detailed below.

3.9.1 Temperature probes. The equipment shall be provided with temperature probes as detailed below.

3.9.1.1 Immersion probe. The equipment shall be provided with an immersion probe in accordance with the following specifications.

3.9.1.1.1 Temperature range. 0° to 260°C (32 to 500°F).

3.9.1.1.2 Accuracy. $\pm 2.2^{\circ}\text{C}$

3.9.1.2 Surface probe. The equipment shall be provided with a surface probe in accordance with the following specifications.

3.9.1.2.1 Temperature range. 0° to 260°C (32 to 500°F).

3.9.1.2.2 Accuracy. $\pm 1.5^{\circ}\text{C}$.

3.9.2 Current probe. The equipment shall be provided with a dc and ac clamp-on current probe in accordance with the following specifications.

3.9.2.1 Measurement range. 0 to 150A in two ranges.

3.9.2.2 Accuracy. DC to 200 Hz, $\pm 2\%$ of range. 200 Hz to 1 kHz, add $\pm 3\%$ of reading for readings below 100A and $\pm 6\%$ of reading for readings above 100A.

3.9.2.3 Clamp size. The clamp shall be capable of encompassing conductors up to but no larger than 1.9 cm (0.75 in).

4. GENERAL REQUIREMENTS.

4.1 Power source. MIL-T-28800 dc internal power source requirements are invoked. The batteries shall be of a commercially available type and provide 500 hours of operation before replacement. A battery state indicator is required in accordance with MIL-T-28800. The nominal power source requirements are not invoked.

4.2 Weight. 4.5 kg (10 lb) maximum, including case and accessories.

4.3 Dimensions. The multimeter shall be 56 mm (2.2 in) high, 100 mm (3.94 in) wide, and 203 mm (8 in) long, nominal. The transit case dimensions shall be 102 mm (4 in) high, 457 mm (18 in) wide, and 381 mm (15 in) long, nominal.

4.4 Lithium batteries. Per MIL-T-28800, lithium batteries are prohibited without prior authorization. A request for approval for the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

4.5 Accessories. A shock absorbing protective holster with a flexible stand device shall be provided.